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COTTON IN MEXICO

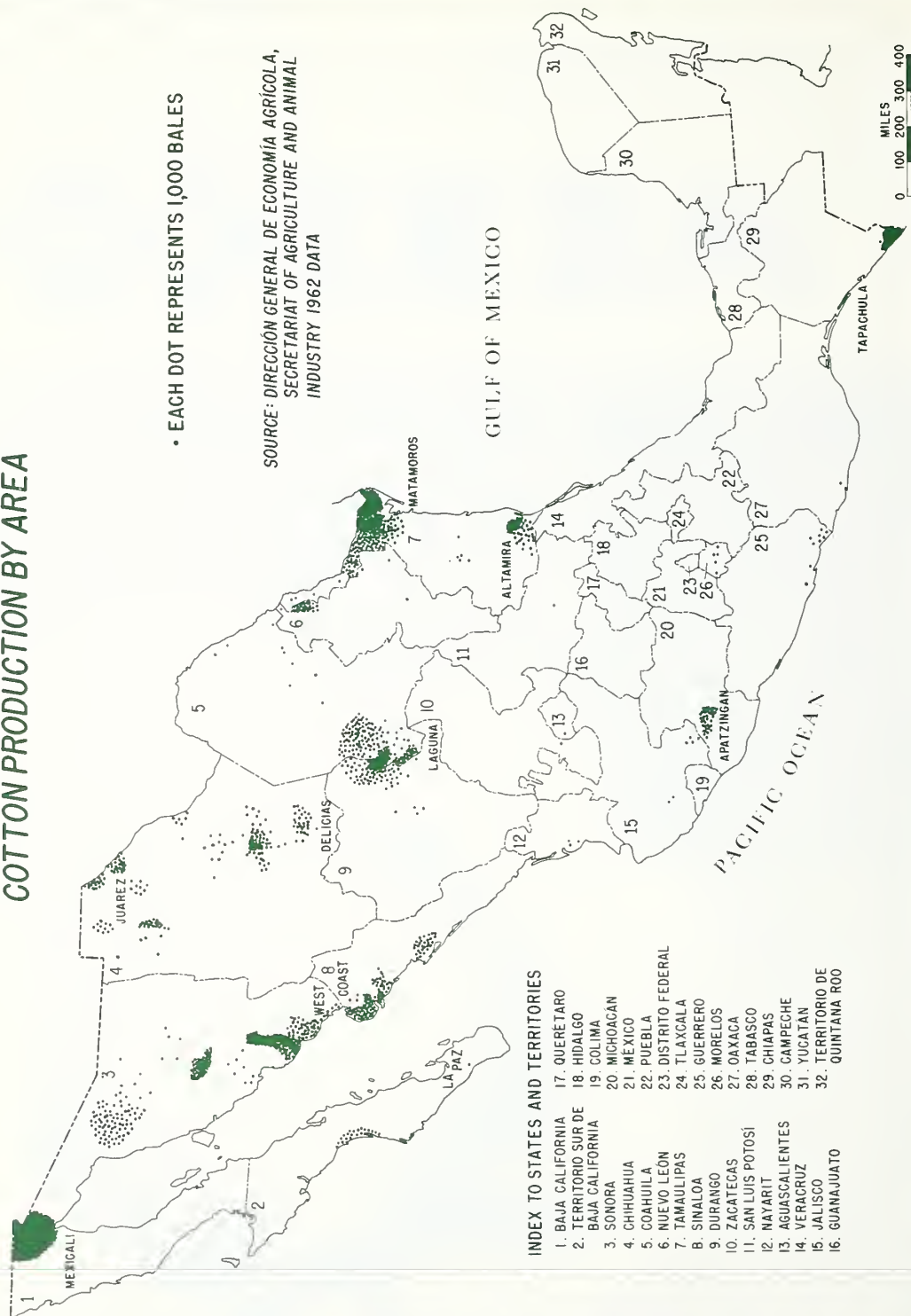


TRENDS
AND
OUTLOOK



MEXICO

COTTON PRODUCTION BY AREA



FOREWORD

Mexico is the foremost competitor of the United States in most of the cotton markets around the world, and for many years has been the world's second largest exporter of Upland-type cotton. Mexico and the United States produce much the same types, varieties, qualities, and staple lengths of cotton, and both countries sell in nearly all foreign markets.

Mexico has made substantial economic progress in recent years, and the cotton industry can claim credit for a significant part of the gain. Cotton is the principal source of livelihood in most of the areas where it is produced, marketed, or consumed. In addition, this crop is Mexico's leading agricultural earner of government revenue through personal, business, and export taxes.

This study takes a close look at Mexico's cotton industry—production, exports, and consumption. Particular attention is given to the shifts presently under way from some producing areas to others within Mexico. This publication is a part of the Foreign Agricultural Service program of reporting on competitive agricultural developments in other countries.

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COTTON IN MEXICO

Trends and Outlook

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Within the next few years, perhaps by 1968-70, Mexico could well be producing at least 2.5 million bales¹ of cotton annually. Mexican cotton acreage and production rose sharply in the decade following World War II. In recent years, acreage has declined considerably, but production has held around the 2-million-bale mark as acreage planted in new areas partly offset declines in older areas and as rising yields offset reduced acreage.

In the future, increased production in the newer areas of Altamira, Tapachula, and several smaller areas will probably more than compensate for a major decline in Matamoros and smaller reductions in crops of a few other older producing areas. Five years ago, production in the new areas totaled less than 60,000 bales. By 1963, this total had risen to nearly a half million bales. In five more seasons, it could well be a million bales.

¹ In this report, bales of cotton are 480 pounds net.

It is possible that increased production will be slowed or stopped by influences like substantially lower cotton price levels, and in some areas by a shift in profit relationships with other crops. Also, the new areas are mostly dependent on rainfall, which is inadequate in some years, excessive occasionally. On the other hand, yields in most areas are high and rising and profits from cotton are attractive.

Mexican cotton will surely continue to compete strongly with U.S. and other cotton for sale in most import markets. For many years, three-fourths of Mexico's cotton crop has been destined for export markets. Exports have averaged over 1.6 million bales annually during the past 5 seasons, compared with 948,000 in the 1950-54 period.

Shipments from Mexico over the next several years will probably total between 1.5 million and 2.0 million bales annually. Direct exports from Mexican ports will almost certainly rise as actions designed to encourage and facilitate greater use of these ports become more effective.

COTTON: SUPPLY AND DISTRIBUTION IN MEXICO, 1954-63¹

Season ²	Stocks Aug. 1	Produc- tion	Imports	Total supply	Con- sumption	Destroyed	Exports	Stocks July 31
	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³
1954 -----	200	1,780	1	1,981	420	8	1,253	300
1955 -----	300	2,250	0	2,550	435	3	2,027	85
1956 -----	85	1,790	0	1,875	460	5	1,310	100
1957 -----	100	2,085	0	2,185	460	8	1,417	300
1958 -----	300	2,345	5	2,650	485	6	1,809	350
1959 -----	350	1,690	2	2,042	485	3	1,304	250
1960 -----	250	2,100	1	2,351	515	1	1,610	225
1961 -----	225	1,995	1	2,221	510	4	1,482	225
1962 -----	225	2,425	1	2,651	510	4	1,897	240
1963 -----	240	2,085	1	2,326	520	6	1,600	200

¹ Partly estimated. ² Beginning August 1. ³ 480 lb. net.

Source: Official and trade statistics, reports of U.S. agricultural attachés, and other information.

Prospects for early expansion of Mexican cotton consumption from the present level of around one-half million bales are not especially promising. Heavy reliance on credit to cover expenses from production through marketing is partly responsible for relatively high retail prices for textiles. Until outdated textile facilities are modernized, and as long as the textile distribution system is geared to a small turnover and relatively wide margins, there is little chance of reducing retail prices and raising domestic

consumption or of gaining textile export markets. Nevertheless, there are reasons to hope that over a longer period of time cotton consumption will be increased substantially in Mexico. Low per capita uses of cotton and other textiles should respond to rising standards of living already in evidence. Also, the Mexican Government is studying the many problems confronting the textile industry. However, no immediate help can be expected from the government, because of other demands on resources.

THE RAW COTTON INDUSTRY

Acreage and production

Agriculture is the dominant factor in Mexico's economy, and cotton plays a key role in the nation's agriculture. Half of the country's nearly 40 million people live in rural areas. Nearly one-fifth of the gross national product is derived from agricultural pursuits, and shipments of agricultural products constitute over one-half of the value of exports. Sales of cotton usually account for nearly one-half of the value of agricultural exports and over one-fifth of total value of exports. Export sales of cotton far outstrip those of other leading crops, which include sugar, coffee, fruits and vegetables, and animals and animal products.

In the decade following World II, Mexican cotton acreage tripled, and production rose by more than 400 percent. This sharp rise resulted largely from the stimulus of strong export demand at favorable prices and of expansion of irrigated acreage. Also conducive to the rapid rise of production was the widespread availability of credit, of technical information and supervision, and of good marketing facilities. These aids were to a considerable extent supplied by national and international cotton firms. In recent years, there has been an acreage decline of about 5 percent, but a result of generally rising yields, production has been maintained near the record level of 1962.

The area devoted to cotton in 1963 totaled 1,943,000 acres—down slightly from a year earlier, and far below the all-time high of 2,700,000 acres in 1955. Since 1955, cotton acreage has dropped in all of the larger traditional cotton producing areas, though the drop in the West Coast area represents a return to more normal acreage. From 1955 to 1963, cotton acreage in the Mexicali, Matamoros,

and Delicias areas declined about one-third. Most of the drop in the Laguna area occurred in 1963, and larger acreage was planted the following season.

A part of the reduction in acreage in older areas has been offset in recent years by expansion into new areas, especially Altamira, Tapachula, and Apatzingan.

Rising average yields during most years of the past decade softened the effects of the substantial acreage reduction in Mexico. From 400 pounds per acre in 1955, yields rose to 564 pounds in 1962 but eased again to 515 pounds in 1963. Much of the rise in yields is attributable to the change of acreage from less to more productive land. Land unsuitable for cotton production for one reason or another was generally the first to be withdrawn from production. Other factors that have contributed to higher yields include better production practices, improved varieties, more effective methods of insect control, and more crop rotation.

Mexico pushed production above a half million bales for the first time in 1948 and passed the million-bale mark 2 years later. By 1955, production had reached 2,250,000 bales—a figure that has been exceeded only by the 1958 crop of 2,345,000 bales and the record of 2,425,000 in 1962. The 1963 crop eased to 2,085,000 bales. The present size of the crop puts Mexico in sixth place among the world's cotton producers, exceeded only by the United States, USSR, Communist China, India, and Brazil. In terms of competition in world cotton markets, however, Mexico must be placed second only to the United States. Nearly all of the cotton grown in the USSR and in Communist China is used within the Communist Bloc, while a large part of the crops in India and in Brazil is consumed domestically.

Water

Availability of water is the most critical single factor affecting cotton production in Mexico. Until recent years, irrigation water was the key factor. Now, production is expanding most rapidly in areas that have sufficient rainfall for cotton production. Before the expansion of cotton into these new areas, nearly all of the cotton was produced in the North and Northwest. Rainfall in these areas is extremely low and highly unpredictable. Major crop production of any economic significance in these areas requires irrigation.

Water from surface storage reservoirs is used to irrigate a substantial part of the cotton area, through well water is important to cotton raising in many locations. Water limitations have curtailed further acreage expansion in most of the traditional producing areas. The major exception to this is the West Coast, where several crops compete effectively with cotton for the limited land.

In addition to limitations on water supply for cotton irrigation, the high salt content of available water is a major concern in the Mexicali area and in parts of other regions. In some areas where wells are the

source of irrigation water, acreage has been reduced or held at present levels because water tables have dropped. Additional wells would lower the water level still further. Perhaps one of the main reasons for the decline of cotton acreage in some regions was that available water supplies were spread over too large an area. Cutbacks were necessary to achieve a balance between crop requirements and available water.

Since the mid-1920's, Mexico has been heavily committed to irrigation projects and the Federal Government has spent close to \$1 billion to date. By the end of 1963, there were more than 12 million acres under irrigation—about one-third of the total cropland under cultivation in any one year. Though many of Mexico's crops have benefited from irrigation, cotton and wheat have been aided most.

Mexico is continuing to commit sizeable federal funds to irrigation projects. The 1964 federal budget has earmarked 9 percent of the total to this purpose, an amount second only to the funds for education. Work is being continued on eight major dams that will eventually provide water for nearly 1.25 million acres of cropland. Besides adding new irrigation projects, Mexico is improving facilities



Here, a field worker runs irrigation water in Yanqui Valley cotton. Until a few years ago when new areas were opened, almost all of Mexico's cotton was produced under irrigation. About eighty percent of the crop is still grown in this way.

such as drainage systems, roads, and telephone services. Area brought into cultivation by irrigation projects completed under Federal Government supervision, from 1926 through 1963, by specified periods, follow:

<i>Period</i>	<i>Thousand</i>
Average:	<i>acres</i>
1926-46	2,016
1947-52	1,547
1953-58	1,848
Annual:	
1959	77
1960	101
1961	106
1962	92
1963	178
Total	5,965

Financing

In many areas, availability of borrowed funds is a prime factor in determining the amount of acreage that will be planted to cotton. Most farm operators depend heavily on borrowed capital to produce each cotton crop, and lenders are prone to withhold financing whenever water is scarce, when world cotton prices are down, or when poor crops of the previous year have prevented growers from paying earlier loans.

A major part of the agricultural credit in Mexico is supplied by government banks, private banks, and private firms at rates of interest well above those in the United States. Loans from private individuals are important in only a few large areas. Often, these loans are made by individual gin operators, partly as a means of assuring that the gin services will be utilized. The Government Agricultural Bank (Banco Nacional de Credito Agricola) provides credit to individual farm operators. The bank generally makes loans to independent operators of relatively small holdings but loans to any farmer are permitted. The Foreign Commerce Bank (Banco Nacional de Comercio Exterior), the Agricultural Bank, and the Bank of Mexico (Fondo de Garantia y Formento para la Agricultura, Ganaderia y Avicultura) provide relatively large amounts of agricultural credit.

The Ejidal Bank (Banco Nacional de Credito Ejidal) makes loans only to members of ejidos (community property worked by individuals). Credit is provided on a monthly basis to ejidatarios (mem-

bers of the ejido) in almost every cotton producing area. Loans are made to cover up to 100 percent of production costs. In addition, money may be provided for land leveling, irrigation facilities, and other capital improvements. However, by far the largest number of ejido bank loans are contracted for a period of less than one year.

In addition to providing credit, the Ejidal Bank fills a number of other needs of the community. The Bank owns and operates machinery pools for cotton growers in some areas. In most areas, the Bank operates cotton purchasing and ginning facilities and assists the farmer in obtaining planting seed, fertilizer, and other production and living needs.

Private banks in Mexico provide some credit for cotton production, though not to the extent found in the United States. Most private bank officials follow a conservative lending policy and for the most part they finance only the larger, more responsible farmers. Nevertheless, some banking institutions are increasing their participation in cotton financing.

Cotton firms operating in Mexico provide a substantial part of the credit available to cotton producers. These private cotton firms—both national and international in scope—assume the role of financing cotton production as a part of their overall cotton business. Generally, these same firms buy the cotton from the producer, so that in many cases the lending of production funds amounts to the first step in forward buying. Although the main emphasis is on production credit, cotton firms lend substantial amounts of money to farmers for such purposes as land leveling, extension of irrigation systems, and machinery purchases.

Interest rates for cotton production in Mexico generally range from about 12 percent per annum to 18 percent and sometimes even higher. The range in interest charges depends on the source of credit, the integrity and financial strength of the borrower, and the outlook for the cotton crop in the various areas. Cotton firms and the Ejidal Bank usually buy the cotton and seed from their loan customers. Normally, the firms provide considerable supervision to borrowers, and check closely on progress of the crop. Frequently such services as sales of fertilizer, insecticides, and machinery to cotton growers are tied closely to finance operations.

Insurance

Mexico has had an agricultural insurance program since 1956. In December 1961, the program was substantially changed and broadened. The

Federal Government now provides 51 percent of the capital, while the remainder is obtained from governmental banks and institutions, mutual fund associations, and private banks and institutions. Crop insurance is required of all farmers who receive loans from governmental lending agencies and many private firms and agencies. In 1963, over two-thirds of the land covered by the program was held by ejidatarios.

The amount of insurance cannot exceed the total cash outlay necessary to grow a crop, nor can it be higher than 70 percent of the estimated value of the crop. Coverage is extended for risks such as storms or drought that are beyond the farmer's control. In past years, the premiums for insurance coverage were set far too low to cover risks and the government absorbed substantial losses. Reportedly, the premiums are now set at more realistic levels and the government pays a part of the premiums for farmers in the lowest economic group.

Varieties

Nearly all of the cotton produced in Mexico is now Deltapine Smooth Leaf, though small quantities of DPL 15, Coker 124B, Acala 4-42, and Acala 1517 are also grown in some areas. Although there is some variation because of growing conditions, practically all of Mexico's cotton is from $1\frac{1}{32}$ through $1\frac{3}{32}$ inches in staple length. Small quantities are shorter than $1\frac{1}{32}$ inches, and some as long as $1\frac{3}{16}$ inches. Relatively small quantities of Acala 1517 are grown in the Juarez Valley with a staple length from $1\frac{1}{8}$ inches through $1\frac{3}{16}$ inches. Mexico produces no extra-long staple cotton.

Most of Mexico's cotton is relatively high grade because a large part of the crop is picked in dry weather. Of course, the bulk of the crop is grown under irrigation and is not exposed to rainfall. However, an untimely rain occasionally falls during the harvest and reduces the grade of a part of the crop. Also, rain is more likely to fall during harvest in some of the newer producing areas where the cotton is raingrown.

Production practices

Cotton farming in Mexico is practiced with considerable variation in efficiency and a wide range in sizes of operation. For the most part, machinery has replaced animal power, particularly in land preparation. The widespread development of irriga-

tion projects, along with the growing use of fertilizer and insecticides and the agricultural education that is carried on by government and credit agencies, has helped to speed up acceptance of modern cultural practices.

Larger-scale cotton operations, generally with highly skilled operators and advanced methods and equipment, are common in many areas of Mexico. Some cotton growers and farm managers are from the United States, while others were trained or educated in this country. Mexico has made considerable use of improved techniques that were developed by the United States and that were adapted to Mexico's crop conditions. Most of the usual farm operating arrangements are in use in Mexico, including operations by owners, managers, and partners. In addition, a substantial part of the cotton acreage is worked under the ejido system.

Machinery is used for nearly all production requirements except harvesting the crop. Heavy machinery is extensively used to clear new land from timber areas, except in Tapachula where hand labor and equipment are widely used. Like some fertilizer and insecticides, much of the farm machinery that is used in Mexico must be imported. Prices on imported farm equipment probably average up to 60 percent higher than those of comparable items in the United States. Nevertheless, nearly all independent cotton growers have at least minimum equipment. Cotton producers on ejidos generally share in use of equipment that is owned by the ejido.

Use of commercial fertilizer in cotton production in Mexico is becoming more widespread with the increased use of improved cultural practices. The use of fertilizer is most common in the older producing areas where cotton has been grown for many years and where irrigation is used. Fertilizers usually are not applied on new land recently cleared of forest. In fact, many farmers report that the use of fertilizer on these new lands may reduce yields by "burning" the plant or may cause excessive growth to plants that are normally too large for optimum production techniques. However, fertilizer use in this area will probably become common within a few years when constant farming reduces the fertility level.

All major types of fertilizers are used in Mexico. The government has attempted in recent years to expand domestic production of basic fertilizers. As a result, imports have declined moderately, while domestic output now exceeds imports. The United States furnishes about half of Mexico's imports of fertilizer.

Insect and disease control

Most of the common cotton insects and diseases are present in Mexico. The boll weevil is one of the major pests of cotton and occurs throughout the country, except in Mexicali. However, the pink bollworm does not occur in the Altamira area, or in any part of the northwestern or southern Mexico.

In general, insects are kept under control through the use of insecticides, but reportedly resistance of insects (especially the common bollworm) to some insecticides has been noted in the Matamoros area. The number of applications required to control insects varies widely from area to area and from year to year. As few as 2 or 3 applications may be all that is necessary in some parts of the West Coast, while more than 20 applications may be needed in the Tapachula area.

Airplanes are used to apply a substantial part of the insecticide. Sprays are most commonly used in some areas, while dusts are used in others. Diseases are relatively minor in most areas at the present time, though *Verticillium* wilt is a major disease in the Laguna, and root rot has been noted in a few localities. Bacterial blight and boll rot are serious problems in Tapachula, while cotton rust has caused considerable damage in Delicias. Each cotton growing area in Mexico has planting and plow-up dates that, if more rigidly controlled, would help reduce carryover of live insects, especially the pink bollworm, into the next season.

Alternative crops

Climatic conditions and topography in many of Mexico's cotton producing areas are well suited to a number of other crops, as well. However, until recent years cotton and wheat accounted for most of the planted acreage in cotton areas. Where water is available, cotton and wheat still claim a major part of the farmer's labor and capital. Cotton is still one of the most profitable crops year in and year out. Other crops grown in cotton areas include alfalfa, barley, corn, flax (for seed), peanuts, rice, grain sorghum, sugarcane, and vegetables. Acreage devoted to these crops is quite limited in most areas by production problems, lack of markets, and low or uncertain returns.

In the past few years, considerable attention has been devoted to finding alternative crops that compete effectively with cotton or that could fit into a cotton or cotton-wheat enterprise. Efforts along these lines have been made as a means of better utilizing water-short acreage and of providing more

diversified farm operations. In addition, cotton is becoming less profitable in some areas because of the rising costs of water use and of pest and disease control.

Wheat (especially new high-yielding dwarf varieties) competes most effectively with cotton for land, water, and capital resources. Wheat requires substantially less water per acre than cotton and is usually one of the first choices for marginal cotton land when the availability of water is reduced. Lower credit requirements for wheat also make that crop more attractive at times, and wheat requires considerably less attention during the growing season. Finally, the price farmers receive for wheat is supported by the Mexican Government. These factors often make wheat an attractive alternate crop in many areas in spite of the generally lower returns per acre.

Sorghum and other small grain crops have displaced cotton acreage in some areas, especially in the northern part of the country. Sesame production has been tried in a number of places, but acceptance has been limited by harvest problems. Rice and sugarcane production require large amounts of water, and production is largely restricted to parts of the West Coast and to Mante, where water is ample. Vegetables are produced on a substantial scale in some areas, most notably on the West Coast. Raising these crops is often extremely profitable, especially for export markets. However, returns are highly variable, and a small overproduction or a short delay in marketing can result in heavy losses.

Government policy

The relative strength of competitive crops is affected to no small degree by the various Mexican Government policies and programs. Of course, the government directly and indirectly influences the availability of water, credit, labor, land, roads, and other production and market requirements. Research and development work can favor one crop over another. Some Mexican Government officials place considerable emphasis upon increased cotton production over the next several years.

Diversified farming practices have received encouragement from the government. In fact, many officials would like cotton production in some of the older areas sharply curtailed or discontinued. At the same time, efforts to aid increased cotton production in other areas, especially the newer ones, are being actively pushed. For example, projects are in progress to resettle persons from northern Mexico to

Tapachula and Baja California. Roads in Tapachula are being built or improved, while complete villages are being erected in Baja California.

Mexico has for some years supported the price of wheat at levels well above world prices in an effort to increase domestic production. Widespread acceptance of improved dwarf varieties, plus generally favorable growing conditions, has enabled Mexico to surpass domestic requirements, and in 1964 close to 500,000 tons were exported. The support price could well be lowered if production continues to exceed consumption because the government is not inclined to subsidize large quantities of wheat for export. Reduced support prices for wheat would improve the competitive relationship of cotton and other crops in areas where acreage shifts away from wheat could be readily made.

Cotton production is affected by still another problem. Mexico imposes a tax on all cotton exported from the country. The tax, presently equal to 1.67 U.S. cents per pound on cotton pressed to a density greater than a regular flat bale, is an important source of revenue for the government. There is considerable agitation from some segments of the cotton industry to remove these taxes, but an action in July 1964 increased the tax on exports of flat bales. Countries that impose export taxes usually place the tax on products that are far more profitable than competitive crops. However, Mexican cotton producers say that the existence of these taxes is no longer "prima facie" evidence of the extreme profitability of cotton compared with other crops. In any case, the removal of the export tax on cotton would considerably enhance cotton's competitive strength.

Other factors that could change the competitive position of cotton vis-a-vis other crops include laws on income taxes and on profit sharing. Mexico is taking steps that will have the effect of increasing tax payments on the incomes of businesses and individuals. Also, most companies will be required to pay 20 percent of their profits to employees. These moves are just now coming into effect, and it is too soon to evaluate the influence they will have on production of the various crops.

Mexico is a member of the Latin American Free Trade Association (LAFTA). The organization is a preferential trade area created by nine Latin American countries. The aim of the members is to increase trade within the group rather than to completely integrate their economies, as is planned by the European Common Market and the Central

American Common Market. It is quite possible that increased shipments of Mexican cotton to other members of LAFTA will be taking place over the next few years.

Harvesting and Ginning

Cotton is picked by hand in Mexico, and harvest begins as early as June in some areas and ends as late as February or March in others. To a considerable extent, transient labor is used. Wages are relatively low—there is considerable variation but the average is probably about one U.S. cent per pound of seed cotton picked. The size of the plant varies widely from extremely short in parts of northern areas to 8 feet tall or higher in Tapachula. In Tapachula, and in some other areas, the height of the plant is sometimes reduced by cutting off the top part during the growing season. The large size of the plants causes lodging and hinders the picking.

The use of picking machines has been tried several times in various areas, but these efforts have met little success. Plant size tends to vary considerably, and the cotton tends to mature over a rather long period. Cotton rows are not planted to meet machine requirements and gins are not now equipped to handle machine-harvested cotton. In addition, there is a substantial cost advantage in using hand labor. Imported picking machines are quite expensive, adequate service facilities are presently unavailable, and the quality of the machine-harvested cotton would be lower than hand-picked cotton. Finally, most of Mexico's cotton is harvested during the dry season when more rapid picking is not especially needed. Of course, machine pickers could come into widespread use if labor becomes scarce or expensive in the future, or if other conditions reverse the present advantage held by hand harvesting methods.

Ginning capacity for the current crop is adequate for the country as a whole, though additional capacity is needed in Altamira. Actually, some of the older, declining cotton areas are plagued with too much ginning capacity, and many installations are being moved to the newer areas. In 1962, the number of gin units and stands in several of the principal cotton producing areas was as follows:

<i>Areas</i>	<i>Gin Units</i>	<i>Stands</i>
Mexicali	66	318
West Coast	72	347
Matamoros	89	440
Juarez	13	58
Laguna	59	262
Delicias	25	115

Few new gins have been erected since 1962 in the above areas, though some old ones have been renovated. In fact, the number of gins has been substantially reduced in some locations. Probably more than half of the gins in Matamoros have been moved or are no longer being used. Present gin capacity in some of the newer areas is estimated as follows: Altamira, 15 gin units and 70 stands; Tapachula, 8 gins and 38 stand; Apatzingan, 12 gins and about 50 stands; and La Paz, 4 gins and 18 stands. In addition, numerous gins are planned in Altamira or are under construction there.

Many of the gins are old, particularly in the older producing areas, but a number of others are quite new and a few have the latest equipment such as automatic sampling devices, high speed equipment, and high density presses. Extra cleaning and drying equipment is not normally needed except in a few areas, since most of the crop is hand-picked in dry weather. All of the plants in Mexico are saw gins. A substantial majority of the gin units have either 4 stands of 80 saws each or 5 stands of 90 saws each. A few units have 4 stands of 100 or 120 saws each.

Most of the gins in Mexico press to standard density. However, part of the crops in Mexicali, and in a few other areas, are pressed to high density in the gin, and a substantial part of the crop in other areas is pressed to low or gin density. The density to which bales are pressed depends to some extent on the market toward which the cotton is directed, though this is not always the case. For example, practically all Mexicali cotton is exported, and the cotton is pressed to standard or high density. On the other hand, much Matamoros cotton is also exported and that crop is packaged in a low density bale. There are few cotton compresses in Mexico, and much of the cotton for export is shipped without being compressed. Exports from Matamoros have been in most instances transshipped through Brownsville, where the cotton was compressed to high density.

Much of the cotton is purchased before ginning by the gin operator, though a sizable part is custom-ginned. Payment is made to the farmer on the basis of gross weight after adjustments are made for the value of the seed and the cost of ginning. Quality is considered when determining the price. Gins for ejidos normally handle member's cotton, although inadequate capacity sometimes causes the ejidos to send cotton to private gins for processing. Cottonseed is normally stored inside, or at least under cover. On the other hand, bales are generally

stored in the open until removal to concentration or export points.

The gross weight of bales in Mexico averages about 230 kilograms (507 pounds). There is some variation in tare because of variations in the coverings and straps used by different gins and areas. Mexico has shifted almost entirely away from the use of jute as a bale covering because of restrictions placed on imports of this item by the government. Jute has been replaced largely by palma and cotton.

Cotton and palma bagging (made from palm fiber) are all made by the domestic textile industry. Reportedly, the lightweight cotton bagging tears rather easily and cannot be used successfully on bales that are to be compressed to high density. The heavier cotton covering is much more suitable but is more expensive than palma. The cotton covering makes a very attractive packing and has been received favorably in Mexico's export markets. On the other hand, the palma bagging is heavier and unattractive, and loses strength when it becomes wet.

Producing areas

Until the past few years, almost all of Mexico's cotton acreage was located in the northern part of the country. The major producing areas were Matamoros, the Laguna, Delicias, Mexicali, and the West Coast. Virtually all of the older cotton areas were located in valleys and dry lake beds, and virtually all of the cotton was grown under irrigation. About the only raingrown cotton was in Matamoros, and there supplemental irrigation was used when available. Even in that area dryland farming was extremely hazardous.

Over the years, cotton acreage and production increased in the older areas, while at the same time plantings of other crops were also placing additional demands on the limited water supplies. In time, shrinking supplies in gravity-flow reservoirs and a general lowering of water tables in well districts caused controls to be placed on acreage planted to specific crops. This lack of water, and in some areas the quality (high salinity) of the water, has caused considerable concern over the future of cotton production in some sections. Certainly, the probability of further expansion of cotton in these older areas over the next few years is dim.

Over the years, cotton production has been attempted in many new locations, with efforts successful in several. Until recent years, however, Mexico depended to a substantial degree for the nation's cotton upon the main producing areas. For example,

in 1958 the five largest of these produced 92 percent of the total crop. In 1963, by contrast, after a sharp rise in production in several new sections and a decline in some of the older, cotton production in the same five areas accounted for only 73 percent.

Recently Developed Areas

Altamira—Centered northwest of Tampico in the State of Tamaulipas, this is one of the newest and fastest growing cotton areas in Mexico. In fact, production in 1963 reached almost 200,000 bales, compared with no commercial crop in 1960. If normal growing conditions prevail, output in 1964 will rise sharply again. Some years ago, cotton production was tried in this area, with dismal results because of unseasonable rain and failure to control insects. However, success this time seems certain because producers have now changed the periods of planting and harvesting and also are giving proper consideration to plow-up dates and other insect control measures.

For the most part, the land is relatively porous black soil with a clay subsoil. This subsoil aids in holding moisture between rains. The area has rainfall of around 35 to 40 inches annually and nearly all cotton is grown here without irrigation. Cotton is planted from mid-June through July, following light rains in May. Rainfall is heaviest during the growing season; therefore, from 10 to 20 applications of insecticides are necessary. Yields during the past 3 seasons have averaged over one bale per acre, though dry weather lowered the 1963 yield below this figure. No fertilizer has been used thus far.

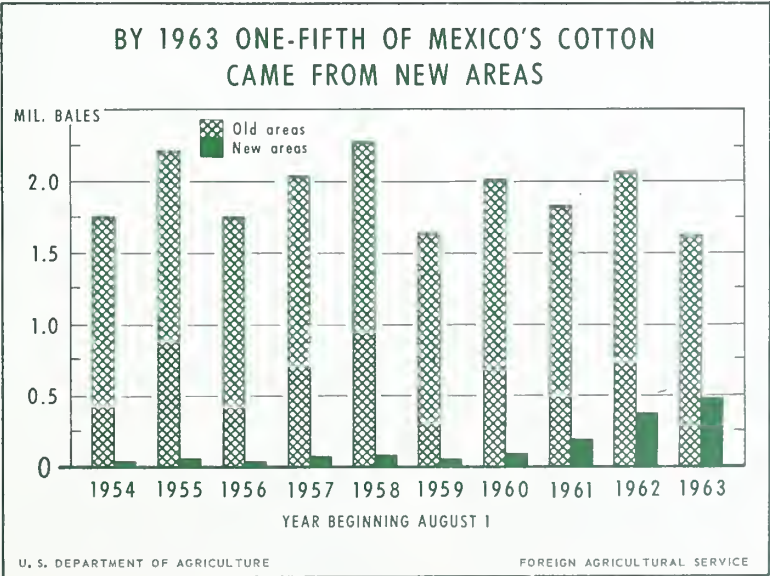
Most of the cotton operations are relatively large, and the farm operators have adequate machinery and resources. Also, most of the farm supervisors gained experience in cotton raising elsewhere before they began operations in the Altamira area.

Expansion of gin facilities has not kept pace with the increased cotton acreage, and last year more than one-third of Altamira's seed cotton was ginned elsewhere, mostly in Matamoros and Victoria. Several of the gins now in use in the Altamira area were moved in from Matamoros. Reportedly, more gins will be moved in from other sections and several new plants will also be erected in the near future.

Through 1963-64, nearly all of the Altamira cotton was moved to Matamoros by truck for transshipment to export destinations through Brownsville. It is quite probable, however, that a compress will be constructed in the area and high density bales will be exported directly from Tampico. Small quantities pressed at standard density are now shipped there.

Cotton has been able to compete very effectively for land in this area. Acreage devoted to pasture and vegetables has declined considerably. In addition, there are large quantities of brush land that, when cleared, will be suitable for crops. Reportedly, this waste land constitutes more than 600,000 acres that could be developed for cotton, within a few years.

Tapachula—This new area near the Guatemalan border in the State of Chiapas shows great promise of becoming one of Mexico's larger cotton producing sections. Production has expanded from practically nothing just a few years ago to 82,000 bales in each of the last two seasons. Further increase in pro-



duction in 1964 will probably be modest, but the crop several years from now could well be double or triple the present size.

Basically, growing conditions in the Tapachula area are similar to those in the cotton area farther south in Guatemala. The Tapachula cotton is grown on relatively level land lying between the mountains and the Pacific Ocean. Rainfall is heavy in the mountains but decreases to 60 inches or less annually in the cotton raising area. Most of the rain falls during the cotton growing season. Cotton is planted during breaks in the weather in August and September. All of the usual cotton insects except the pink bollworm are present and are controlled by 20 or more applications of insecticides, mostly spray, from airplanes. Heavy losses occur each year from boll rot and bacterial blight. Deltapine Smooth Leaf is about the only seed planted. The staple length ranges mostly between $1\frac{1}{32}$ and $1\frac{3}{32}$ inches.

About 90 percent of the cotton is grown by independent farmers, the remainder on ejidos. Most operations except harvesting are mechanized—the ejidos make joint use of machinery. There are about enough ginning facilities for the present crop but additional equipment will be needed as expansion takes place. Most of the cotton is pressed to standard density and covered with palma. In each of the past two seasons, more than two-thirds of the Tapachula crop was exported, mostly through the port of Salina Cruz. The remainder is sold for consumption in Mexican mills. At present, all cotton is transported out of the producing area by train. There has been some difficulty in getting enough railroad cars to meet the needs for cotton transport, but it is expected that this situation will improve soon as a new paved road opens and trucks become available.

There seems to be no close competition with cotton for the land, from other crops. Coffee is best suited to the hillsides, and banana production in this area is risky because of disease. Large areas of forest land can and probably will be cleared for cotton in the next several years. Most of the clearing is done by hand but some heavy machinery is used. Land and clearing are relatively expensive, but these costs are offset to a considerable extent because yields are fairly high and irrigation is not needed. The government is aiding further expansion through construction of roads into new cotton areas.

Apatzingan—Another of the larger new areas of cotton production in Mexico, Apatzingan is located west of Mexico City in the State of Michoacan. In the past, this area was Mexico's major source of

commercially produced limes, but cotton and vegetables have become increasingly important in recent years and have replaced limes in some cases. Cotton production in 1963 reached about 138,000 bales, the same as a year earlier. Deltapine Smooth Leaf is the only variety planted, and the average staple length is about $1\frac{1}{16}$ inches. Yields have thus far averaged over one and one-half bales per acre.

A substantial part of the cotton is grown on small ejidal holdings. Much of the Apatzingan area is irrigated, though there is a considerable acreage of raingrown cotton. Insects are being well controlled by insecticides applied by airplane. There are sufficient gin facilities to process crops of the size produced in 1963. Transportation from this relatively remote location is difficult, and all cotton is hauled from the immediate area by truck. Much of the crop is exported through the port at Mazatlan, but sizable quantities are shipped through Manzanillo in the State of Colima.

The expansion of cotton in this area may well have reached its peak, and acreage might even decline slightly over the next several years under pressure of competition from fruit and vegetable production for the limited cropland. There is almost no new land to be cleared and developed. However, some information indicates that cotton could prove to be attractive enough over the long run to displace still more fruit acreage.

La Paz—Cotton production was initiated in this area of Baja California a decade ago and output has held near 30,000 bales in recent years. The main producing area is located about 100 miles north of the city of La Paz in the Santo Domingo valley. Wheat and cotton account for nearly all of the cropland in present use—wheat alone about two-thirds.

Cotton is irrigated by medium-deep wells. To prevent further lowering of the water table, output per well is regulated and now new wells can be drilled without government permission. Insects have not yet become a serious problem and are controlled by a relatively few applications, mostly in liquid form by spraying from airplanes. While three gins operate in the producing area, some seed cotton is hauled to the gin at La Paz, as well. All gins have standard density presses. Most of the bales are covered with heavy cotton cloth, but some palma is used.

About 35 percent of the cotton grown in this area is Deltapine Smooth Leaf, 35 to 40 percent is Coker 124, and most of the remainder is Acala 4-42. Staple lengths range from $1\frac{1}{32}$ to $1\frac{3}{32}$ inches, except for some Acala which is as long as $1\frac{1}{8}$ inches. A few farms have several hundred acres of cotton,

but most producers have less than 100 acres planted with this crop.

The area's soil is relatively porous, so no drainage is needed. However, land leveling would be useful on many farms. All of the cotton raised here is trucked to La Paz, where a substantial part is loaded for direct export from one commercial pier in the city. The remainder is shipped across the gulf to Mazatlan for concentration before being exported.

The Mexican Government is actively encouraging settlement of this virtually uninhabited territory. Care is being taken, however, to allow only as many settlers as can reasonably be expected to live in an area that must depend entirely upon the limited well water. Under government sponsorship, a new ejido group is to be formed soon in a new area about 175 miles north of Santo Domingo. Cotton is expected to be the major crop there.

It appears that the present level of production in the La Paz area will hold for the next year or two. Over the longer run, production could rise from better use of water in the existing cotton area; in addition, a significant increase will probably take place as developments progress in the new areas to be opened farther north.

Other new areas—Small acreages of cotton have been initiated in recent years in a number of other parts of Mexico. Areas showing greatest promise of expansion are in the States of San Luis Potosi, Morelos, Guerrero, and Chiapas. However, it is not likely that any of these will rival Altamira or Tapachula for rapidity of expansion within the foreseeable future. Of this group, perhaps the area near Rio Verde in San Luis Potosi shows the most promise of attaining importance as a cotton producing area within the next few years. However, cotton there faces strong competition from citrus, sugarcane, and vegetable crops for the use of irrigated land.

Older Established Areas

Matamoros—This is one of the oldest cotton producing areas in Mexico, and until the 1963 season was also usually the largest in terms of acreage. It lies in the State of Tamaulipas, across the river from the Rio Grande Valley around Brownsville. Rainfall is light and highly unpredictable, and much of the cotton is now grown under irrigation. The irrigation water is mostly supplied from surface lakes, but a few wells are used also.

Water supplies in the reservoirs have never been ample—in fact, in some years there was only enough

water to irrigate the cotton one time. Getting added water from wells has not been possible because of the high mineral content of the subsurface water. The shortage of good quality water has worsened the problem of soil salinity that is widespread in this area. In addition to water problems, plant diseases and insects become more difficult to control each year, reports from Matamoros indicate.

With production in this area declining for several years, another sharp drop took place in 1964. The 1963 crop was only 163,000 bales, compared with 369,000 a year earlier, and a record of 550,000 in 1958. Yields have trended lower in the past few years, although the downward trend has been slowed because the lowest yielding land usually has been taken out of cotton first. Acreage is now less than one-fourth as large as in 1958, when 840,000 acres were planted to cotton.

The official planting period for Matamoros is from February 1 through March 15. However, in 1963, experimental plantings were made during June and July. Yields on some of the experimental acreage were high enough to encourage a considerable expansion of late cotton in 1964. Serious pest control problems may result from this move to change the planting date on the Mexican side of the border. Since the maintenance of a cotton-free period is essential for effective control of the pink bollworm, and to a lesser degree the boll weevil, uniformity in planting dates on both sides of the Rio Grande seems fundamental.

There has been considerable official and commercial encouragement to cotton growers in Matamoros to shift to other crops, particularly corn, wheat, and grain sorghum. Financing for cotton production is difficult to obtain in view of the relatively poor record or repayments in recent years and the unfavorable outlook for cotton yields in this area.

Ginning capacity in Matamoros is more than ample in view of the sharply reduced crop. A large number of surplus plants have been moved to other areas, particularly Altamira. Practically all of the cotton exported from this area through 1963–64 was hauled to Brownsville, where the bales were compressed to high density before being transshipped to foreign destinations. There are two compresses in Matamoros at the present time, but one is not in operation.

In view of the action by the Mexican Government in July 1964 to increase export taxes on cotton not pressed to a density higher than the regular flat bale, it seems likely that the importance of Brownsville as a transshipment point will decline even further if

cotton from the Altamira area is exported through Tampico.

Laguna—The Laguna area is located mostly in the States of Coahuila and Durango, and is centered around Torreon. For many years this was the leading cotton region in Mexico; but after World War II it was surpassed, first by Matamoros, and then by other areas.

Production fell below 200,000 bales in 1963 compared with 273,000 in 1962, and a peak of 396,000 in 1955. Yields are relatively high in the Laguna, and their rise has to some extent offset declining acreage. Area devoted to cotton fell to 114,000 acres in 1963, compared with average acreage of 235,000 in the previous 5 years.

Water in this irrigated area comes from both gravity sources and deep wells. In the past, low water supplies have sharply limited crop acreage. This will probably prevent significant expansion in the future as well, although an occasional temporary expansion may occur, as it did in 1964, when an unusually large quantity of available water in the reservoirs allowed ample irrigation.

Over the longer run, cotton production in the Laguna area can be expected to meet increased pressure from other crops for the limited water supplies. Agriculture is well diversified. In addition to cotton, other major crops in this area include wheat, corn, and other grains, alfalfa, grapes, and vegetables.

Mexicali—Mexicali now is the second largest cotton producing area in Mexico in terms of production. It is an extension of the Imperial Valley and lies mostly in the State of Baja California, south of the border at Calexico, California.

Cultural practices in this area are, in general, fairly good and there is adequate machinery to take care of normal requirements. As in all Mexico virtually the total Mexicali crop is hand-picked, and this practice probably will be continued as long as labor remains relatively inexpensive. Insects are at present causing no special problem because control is in general good. The region is not infested with the pink bollworm or the boll weevil. The variety of cotton produced is Deltapine Smooth Leaf. Most is of uniformity high quality and averages close to $1\frac{1}{16}$ inches in staple length. There is really no close competition from other crops for the land, although areas planted in wheat are often increased when water is more limited than usual.

Ginning facilities are adequate for the present crop. Most gins are modern and in good repair. Several are equipped with high density presses, and

a few automatic samplers are in use. Since nearly all of the area's production is exported, most cotton bales are gin-pressed to a standard density or higher, and some is compressed in the area's one cotton compress. As a result of the government's discouragement of the use of jute for cotton bale covers, most of the area's cotton is covered with palma or cotton bagging.

Acreage of cotton in the Mexicali region for the next several years will probably remain at around 300,000 acres and production around 500,000 bales. To maintain this output extremely high yields must be continued despite serious problems. Irrigation water is quite limited and the average salt content is near the critical stage. Most of the water for this area comes from the Colorado River under terms of an agreement between the U.S. and Mexican Governments. Under terms of the treaty, the amount of water received by Mexico is determined by the available supply. For some years now, Mexico has been receiving the minimum amount under the agreement. A number of deep wells are located in the area but further drilling is restricted because the water table is falling. Better use could be made of available water through installation of lining in irrigation ditches, additional leveling of many fields, and some shifting of cotton to more suitable land.

Nearly all of Mexicali's cotton is exported through the port at Ensenada. This is in sharp contrast to a few years ago, when sizeable quantities were transhipped through San Diego and other U.S. West Coast ports. During the past few years, the Mexican Government improved the road from Mexicali to Ensenada, and enlarged and improved the port facilities at Ensenada. The port is now capable of handling two ocean vessels at the same time. Adequate reliable labor is readily available for loading the cotton under contract on a price-per-ton-basis, and there is a slight financial saving to the transporter when this port is used. There is open storage on concrete for about 60,000 bales. The limited inside storage space near the piers may be enlarged in the future. There is considerable available open space near the piers that could be developed if the need should become great enough. Around 80 percent of the cotton leaving Ensenada is normally destined for Japan.

West Coast—This area in the States of Sonora and Sinaloa is the center of Mexico's richest agricultural regions. Indeed, it can be called Mexico's "bread basket". Here is the region that provided

the base for Mexico's ability to attain self-sufficiency in wheat production in the last few years.

Assuming continuation of present competition for available land, cotton production in this area probably has reached the limit of expansion. Over the next several years, size of the cotton area probably will remain between 400,000 and 450,000 acres, while production hovers around the 600,000-bale level. Cotton faces considerable competition from wheat, and from several other grain and oilseed crops. The southern portion of the region grows large quantities of vegetables, while farmers in the northern part are becoming interested in grapes.

Almost all of the cotton on the West Coast is grown under irrigation—in the north, mostly from deep wells, and south of Ciudad Obregon, mostly from surface water. Well water is expensive and the water level dropping. In the fall of 1964, in a move to conserve water, the government planned to install meters on the wells and reduce pumping in the Hermosillo area by 15 percent. However, this water reduction is expected to be more than offset by a requirement imposed in conjunction with it that irrigation ditches must be lined with asphalt or tile to reduce seepage. Surface water is adequate for normal use in irrigation in cotton areas from Ciudad Obregon to Los Mochis.

Insects are well controlled by up to 12 applications of dust or spray from airplanes. The boll weevil is present over much of this area. Deltapine Smooth Leaf accounts for most of the acreage but small areas of DPL 15 and Coker 124B are also planted. Most cultural operations are fully mechanized but in a few places mules are still in use, and picking continues to be done by hand.

There are adequate gin facilities on the West Coast. All of the cotton is pressed to standard density for exporting. Some cotton bagging is used, but a sizeable majority of the bales are covered with palma.

The port at Guaymas handles about 500,000 bales a year, mostly from the West Coast area. Here, several ships can be loaded at one time from the piers, but only two or three piers can handle large ocean vessels. In addition to Guaymas, the port at Mazatlan handles sizable quantities of cotton from the West Coast and other areas of Mexico, including Turreon. Farther south, a port at Manzanillo is becoming increasingly important for shipments from several cotton producing areas.

Other old areas—The other long-established cotton producing areas in Mexico—Delicias, Juarez,

Anahuac, Monterrey, and Nuevo Laredo—are not likely to increase production over the next several years. Most will do well to maintain present production levels. In fact, both the pressure from grain and other food crops, and the never-ending shortage of water, seem certain to pull down cotton acreage over the longer run.

Production outlook

Cotton production in Mexico in 1964 recovered from the 1963 setback. A substantial part of the expected rise in Mexican cotton production over the next few seasons appears certain to take place in the rapidly expanding cotton area near Tampico. Production there expanded from none in 1960 to nearly 200,000 bales in 1963. More land continues to be cleared. There are several other newly developed areas near the Pacific Coast in Mexico, but further expansion in these areas is likely to take place more slowly than at Tampico.

Over the next several years, increased production in the newer areas will probably more than offset declines in Matamoros and a few other older producing areas. Production increases might be slowed or stopped by substantially lower price levels to growers, and in some areas, also, by lower profits for cotton in relationship with other crops. Nevertheless, in many areas yields are high and rising and profits attractive.

Just five seasons ago, production totaled less than 60,000 bales in the new areas. By 1963, it had risen to close to a half million bales, and could well total a million bales in five more seasons.

Within the next few years, perhaps by 1968-70, Mexico might be producing 2.5 million bales annually. This is based on the assumption that relatively attractive cotton prices will continue and that there will be little change in government policy or in the relationships between cotton and other crops. Total area devoted to cotton by 1968-70 is estimated to remain around two million acres. Therefore, this production figure depends on an overall rise in yields. This rise seems probable, since Mexico's average yield is now rather low for a country with so much cotton produced under irrigation and with a high level of production practices.

It seems reasonable to expect that cotton production will move from low-yielding areas to high-yielding areas. Actually, there are some indications that the total of 2.5 million bales may be low. Certainly, Mexico's production could be somewhat higher.

FOREIGN TRADE IN COTTON

Exports

Exports of raw cotton are the lifeblood of Mexico's cotton industry as well as one of the nation's leading earners of foreign exchange and of tax revenue. Indeed, three-fourths of Mexico's cotton production is destined for export markets. In the past 5 seasons, exports have averaged over 1.6 million bales annually, compared with 948,000 in the 1950-54 period and only 105,000 bales in 1934-38.

Mexican Government officials fully understand the role played by cotton exports in the nation's economy and it is reasonable to assume that no moves will be taken that will reduce shipments. At the same time, the government seems likely to maintain a tax on exports of cotton as a ready source of revenue. Some use is made of trade agreements to stimulate trade with foreign countries, though cotton is seldom a large factor in these agreements. Cotton exports come into play more frequently in Mexico's "compensatory exchange program". This is a system whereby the export of agricultural products can be used to obtain import permits for items subject to import licenses. During 1963, cotton accounted for about 40 percent of the value of total exports under this program. Principal imports under the program included machinery, assembly parts for motor vehicles, railroad equipment and locomotives, and chemical and paper products.

The National Bank of Foreign Commerce announced in January 1964 a "joint action" plan intended to strengthen Mexico's position in foreign markets. The measure is intended to be carried out through joint actions of public and private interests. Proposed points of action with respect to exports include the unification of supplies of export commodities, the travel abroad of trade missions, and the establishment of Mexican commercial organizations in foreign markets. Through commercial organizations, the Bank contributes to financing export transactions.

In July 1964, the Mexican Government announced that the long-standing reduction in the ad valorem tax on cotton exported from Mexico would no longer be allowed on exports of uncompressed cotton. Therefore, the effective export tax on uncompressed cotton became \$18.62 per bale, compared with a rate of \$8.04 per bale of compressed cotton. This action will surely give further encour-

agement for the construction of compresses within Mexico.

In the past, large quantities of Mexican cotton moved through U.S. ports, though this quantity had been declining for several years. Less than 30 percent of Mexico's total cotton exports were transshipped through U.S. ports in 1962, while nearly three-fifths went via this route in the 1955-59 period, and nearly 90 percent in 1950-54.

For the past few years, almost all of the Mexican cotton transshipments moved through Brownsville, in contrast with earlier years when sizeable quantities were transported via San Diego and Los Angeles. Transshipments through West Coast U.S. ports declined with the opening of the port at Ensenada and the improvement of roads from the cotton-growing areas around Mexicali, while trade through Brownsville was lower because of smaller cotton production in the northeastern part of Mexico.

Mexico's cotton is exported to most of the same markets that obtain cotton from the United States. In fact, Japan is the best market for both Mexican and U.S. cotton. Average annual exports of Mexican cotton to major destinations in the 3-year period 1960-62 were as follows:

Country	<i>From Mexican ports 1,000 bales</i>	<i>From U.S. ports 1,000 bales</i>	<i>Total 1,000 bales</i>
Japan	618	54	672
Germany, West	66	81	147
France	59	83	142
Italy	35	73	108
Spain	46	35	81
United Kingdom	23	33	56

Prices

In past years, Mexican cotton tended to sell in world markets at prices slightly below comparable U.S. qualities, partly because of quality factors and partly because of a desire for rapid and complete disposal of exportable supplies. However, offering quotations for Mexican and comparable qualities of U.S. cotton in foreign import markets indicate that the prices for these growths were competitive during 1963-64. It is now generally accepted that quality characteristics of Mexican cotton equal those of competing growths. In fact, some buyers in export

markets claim a preference for Mexican over U.S. cotton because they say they prefer hand-harvested cotton over machine-harvested cotton. Whereas nearly all of Mexico's cotton is Deltapine Smooth Leaf, only about one-fourth of the 1963 crop in the United States was planted to this variety. On the other hand, 15 percent of the U.S. acreage was planted to Acala, while only a small quantity of this variety was grown in Mexico.

Perhaps factors that are more important than alleged differences in quality in causing Mexican cotton to sell, in general, below U.S. cotton are the lack of adequate storage facilities and relatively high interest rates. Apparently, storage charges on cotton are not excessively high, but cotton merchants sell cotton as soon after harvest as feasible in order to terminate interest charges. Mexican cotton handlers have chosen not to construct much cotton storage capacity in view of the dry climate in most producing areas, and the tendency for cotton to move to market rather rapidly. However, delays in shipment sometimes result in rain damage to cotton stored in open areas.

Imports

Mexico has an import quota of about 4,000 bales of cotton with a staple length of $1\frac{3}{8}$ inches or longer. Imports into Mexico, almost all from Egypt, seldom exceed 1,000 bales a year. A considerable portion of Mexico's mill output has a relative low end-use value. On the other hand, the domestic crop is comprised mostly of relatively long-staple and high-quality cotton. Therefore, it appears that Mexico could use sizeable quantities of shorter staple cotton to achieve a better balance with the domestic crop for use in the mills.

Export outlook

Mexico will continue for the foreseeable future to provide stiff competition with the United States and other cotton producing countries for sales of cotton in export markets. Shipments should total between 1.5 and 2.0 million bales annually during the next few years. Probably, exports will continue to com-



Almost all bales of Mexican cotton are now covered with palma cloth (shown, left), or with cotton cloth (right). Here, bales awaiting shipment at Ensenada illustrate the open storage method frequently used for cotton moving to market. Recently improved port facilities have resulted in increased direct shipments of the country's cotton.

prise about all of the exportable supplies each year as in the past, with only near-minimum stocks on hand at the end of each season.

Direct shipments of cotton almost certainly will rise as actions designed to reduce transshipments are made more effective. The port at Ensenada will probably continue to handle nearly all of the Mexicali crop. The port at Guaymas should continue to handle the bulk of the West Coast crop, the largest volume in Mexico, but the ports at Mazatlan, La Paz, and Manzanillo could well grow in importance. Similarly, the shipment point at Salina Cruz for the Tapachula crop should expand to meet the needs

of a larger crop in that area. However, the port that shows the greatest promise of expansion as a cotton shipment point is Tampico. Facilities for compressing bales to high density may be erected soon. When this happens, and when enough gin capacity is available in the area, a major part of the Altamira crop can be exported directly through Tampico to foreign destinations.

Japan has been the major market for Mexican cotton for many years and that country will probably continue as the largest export market for Mexican cotton, although European and Canadian markets are also important.

COTTON TEXTILE INDUSTRY

Current situation

The cotton textile industry in Mexico has operated under unfavorable conditions for a number of years. Consumption of cotton has not kept pace with Mexico's rising population, while the use of manmade fiber has risen sharply. The cotton industry is plagued with obsolete equipment and has found it extremely difficult to compete with foreign-made textiles in export markets in spite of relatively low wages in the cotton textile industry and raw material costs.

The cotton textile industry in Mexico is among the oldest industries in the Western Hemisphere, and continues to rank among the largest employers in Mexico. Textile mills employed about 55,000 workers at the end of 1963. Cotton consumption has held at just over a half-million bales for the past few years, after climbing slowly since the mid-1950's.

The industry is small-scale. A report published several years ago by the United Nations showed that less than one-fifth of Mexico's textile mills had 10,000 or more spindles, while over one-fourth of the mills had less than 2,000 spindles. Over 60 percent of the weaving mills had less than 100 looms each, and less than 10 percent had 500 or more looms. About one-fifth of Mexico's mills are engaged in spinning operations only, about two-fifths weave only, and two-fifths operate both spinning and weaving equipment, according to recent reports. The number of mills has changed very little in recent years. Also, less than one-third of Mexico's textile equipment is considered to be modern.

Per capita availability of cotton textiles for consumption in Mexico fell to just above 6 pounds in 1962 compared with nearly 7 pounds per person in

the 1955-59 period, according to the Food and Agriculture Organization of the United Nations. During this same span of time, per person use of rayon fell somewhat, while use of noncellulosic fibers rose rapidly. Since that time, total per capita fiber use has eased moderately.

The use of manmade fibers in cotton mills has continued to rise in recent years, with the greatest interest now being given to the noncellulosic group. In 1962, a number of additional textile plants were authorized for the first time to use manmade fibers in their plants, generally in blends with cotton. In addition, plants that had permission to use manmade fibers were then allowed to use unlimited quantities.

Textile capacity has increased slowly over the past decade, but to a large extent additional capacity has done little more than offset loss of aging equipment already in place. Also, increased use of manmade fibers in cotton textile mills has offset much of the increased capacity insofar as raw cotton is concerned. The number of installed spindles and looms in Mexico from 1954 through 1962 is shown below:

<i>Year</i>	<i>Spindles Millions</i>	<i>Looms Thousands</i>
1954	1,128	37.5
1955	1,130	37.4
1956	1,145	*
1957	1,169	36.4
1958	1,188	36.4
1959	1,192	40.0
1960	1,350	40.0
1961	1,350	40.0
1962	1,350	39.5

* Not available.

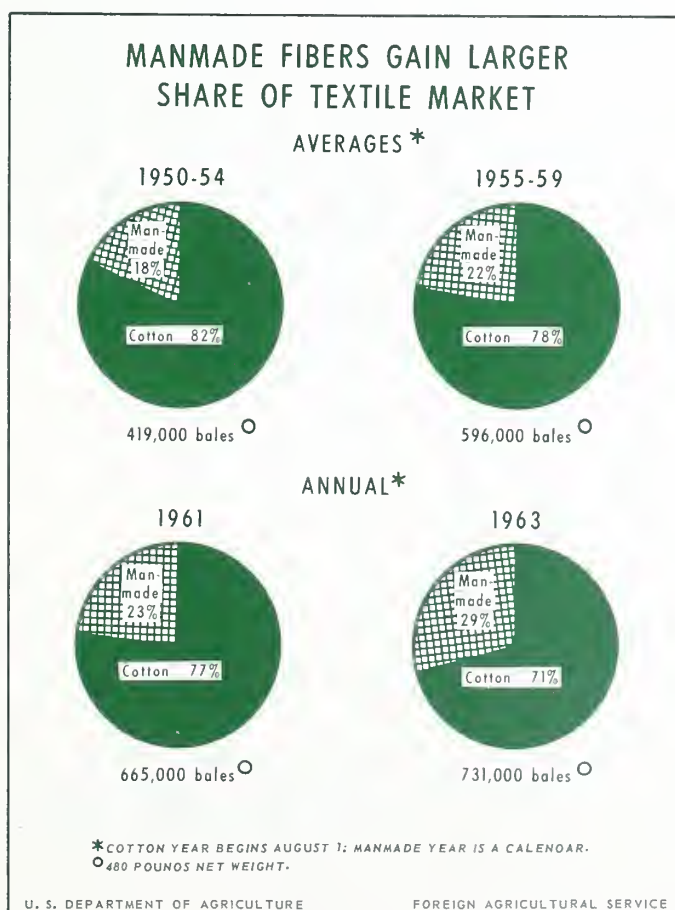
The moderately increased consumption of cotton, by the end of the decade, together with the use of more manmade fiber, is at present being handled on the above equipment through the use of multiple-shift operations and some modernizing of equipment. A limited quantity of textile equipment and spare parts is manufactured in Mexico, but machinery output has not met the needs of the industry. The government has attempted to stimulate manufacture of textile equipment by placing all types of textile machinery, and parts, under the import license system. This move has caused considerable difficulty and delay in obtaining repair parts and new equipment.

In terms of present per capita consumption of textiles, Mexico is about self-sufficient in production of clothing. Although small textile factories are scattered through the country, nearly all of the larger plants are concentrated near Mexico City and in the cities of Guadalajara and Monterrey.

Foreign trade in cotton goods is insignificant, ex-

cept in the zone along the U.S. border. It has been estimated that around 275 million worth of clothing enters the border zone from the United States each year. However, imports into the interior of Mexico are restricted by strict licensing. Mexico has not been able to develop noteworthy textile export markets. Nearly all of the textiles exported in recent years have gone to Indonesia under terms of a trade agreement, but small quantities have been shipped also to the United States, Canada, and other countries.

Retail prices of cotton textiles are relatively high in Mexico. A large part of the cotton used domestically goes into rather low-quality end-uses, and Mexico grows very little shorter staple cotton for these items, and imports none. Large quantities of higher quality, longer staple cotton are used for these products. Large amounts of high-interest credit are used all along the line from the growing of the cotton to the retail level. And, of course, the industry is burdened with outdated equipment and



with difficulties in importing new machinery and parts. All of these disadvantages far outweigh the major advantage that the cotton industry in Mexico has over the industries in many countries, such as low labor cost and availability of locally produced cotton. Cotton for use in the domestic textile industry is not subject to the export tax, that at present amounts to 1.67 U.S. cents per pound, on cotton pressed to a density greater than a regular flat bale. However, in years when export prices are favorable, demands on available supplies sometimes drive price of cotton for domestic use above that for export.

Consumption outlook

Prospects for expansion of the Mexican cotton textile industry during the next few years are not particularly encouraging. Domestic consumption of manmade fibers appear certain to increase rather rapidly in the near future, but most of the increase will probably be at the expense of a possible gain in

use of cotton. Until outdated machinery is replaced with more efficient equipment and until the distribution system is changed to facilitate high volume sales, there is little chance of reducing retail prices and raising domestic consumption or of gaining export markets for textiles.

The Mexican Government is studying the many problems confronting the cotton textile industry, but the government has many other claims on its resources, and no prompt solutions are in sight. Nevertheless, it seems reasonable to hope that over a longer period of time cotton consumption will rise substantially in Mexico. Higher standards of living are within reach and per capita use of cotton and of other textiles is relatively low. Also, retail prices could be reduced when a way is finally found to modernize the textile industry and to effect economies in Mexico's textile marketing system. Even then, cotton will find it hard to regain markets lost to manmade fibers, which have already gained a strong foothold in the textile industry.

STATISTICAL APPENDIX

TABLE 1.—COTTON: ACREAGE, LINT YIELDS, AND PRODUCTION IN MEXICO BY AREA, SEASONS¹, 1954-63

Area	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres
Acreage:										
West Coast -----	350	740	367	451	580	335	546	440	448	379
Mexicali -----	450	482	420	450	470	334	350	339	325	300
Altamira -----	(²)	(²)	(²)	(²)	(²)	(²)	(²)	14	79	201
Laguna -----	246	319	298	243	235	227	270	222	223	114
Matamoros -----	525	725	672	750	840	618	710	605	519	486
Apatzingan -----	(²)	(²)	(²)	(²)	(²)	(²)	31	67	89	86
Tapachula -----	(²)	(²)	(²)	(²)	(²)	(²)	27	43	64	82
Delicias -----	125	174	172	173	195	128	170	171	149	112
Juarez -----	35	46	52	51	48	62	57	65	82	97
La Paz -----	12	26	29	49	37	10	8	15	17	20
Anahuac -----	17	37	14	6	15	35	46	18	31	27
Monterrey -----	(²)	37	15	13	13	5	6	4	3	4
Nuevo Laredo -----	(²)	37	31	24	30	6	7	1	2	4
Other -----	60	68	25	37	47	38	6	16	33	31
Total -----	1,820	2,700	2,095	2,247	2,510	1,798	2,234	2,020	2,064	1,943
	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.	Lb.
Yield:										
West Coast -----	525	410	466	581	502	529	514	623	680	742
Mexicali -----	471	426	390	436	489	510	605	626	730	810
Altamira -----	(²)	(²)	(²)	(²)	(²)	(²)	(²)	549	571	463
Laguna -----	673	596	572	565	594	636	546	651	588	838
Matamoros -----	301	301	301	290	314	288	255	195	341	161
Apatzingan -----	(²)	(²)	(²)	(²)	(²)	(²)	790	630	750	770
Tapachula -----	(²)	(²)	(²)	(²)	(²)	(²)	587	569	615	480
Delicias -----	718	543	522	705	576	604	562	455	570	309
Juarez -----	507	365	369	376	610	387	522	510	462	376
La Paz -----	280	517	513	353	350	528	600	672	847	696
Anahuac -----	367	117	171	320	384	288	240	373	310	267
Monterrey -----	(²)	221	384	148	295	384	160	600	480	360
Nuevo Laredo -----	(²)	182	279	400	320	320	69	(²)	480	360
Other -----	296	226	442	428	582	543	720	270	407	294
Total -----	469	400	410	445	448	451	451	474	564	515
	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³	1,000 bales ³
Production:										
West Coast -----	383	640	356	546	606	369	585	571	635	586
Mexicali -----	442	428	341	409	479	355	441	442	494	506
Altamira -----	(²)	(²)	(²)	(²)	(²)	(²)	(²)	16	94	194
Laguna -----	345	396	355	286	291	301	307	301	273	199
Matamoros -----	329	454	422	453	550	371	377	246	369	163
Apatzingan -----	(²)	(²)	(²)	(²)	(²)	(²)	51	88	139	138
Tapachula -----	(²)	(²)	(²)	(²)	(²)	(²)	33	51	82	82
Delicias -----	187	197	187	254	234	161	199	162	177	72
Juarez -----	37	35	40	40	61	50	62	69	79	76
La Paz -----	7	28	31	36	27	11	10	21	30	29
Anahuac -----	13	9	5	4	12	21	23	14	20	15
Monterrey -----	(²)	17	12	4	8	4	2	5	3	3
Nuevo Laredo -----	(²)	14	18	20	20	4	1	(²)	2	3
Other -----	37	32	23	33	57	43	9	9	28	19
Total -----	1,780	2,250	1,790	2,085	2,345	1,690	2,100	1,995	2,425	2,085

¹ Beginning August 1. ² If any, included in others. ³ 480 lbs. net.

Source: Official and trade statistics, reports of U.S. agricultural attachés, and other information.

TABLE 2.—DIRECT EXPORTS OF COTTON FROM MEXICO BY COUNTRY OF DESTINATION, AVERAGES 1950-54 AND 1955-59, ANNUAL 1960-63

(Bales of 480 lb. net)

Destination	Year beginning August 1					
	Average		1960	1961	1962	Aug-June 1963
	1950-54 ¹	1955-59				
	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales
Australia	0	3	(²)	2	8	2
Belgium & Luxem.	10	21	9	12	23	7
Canada	2	29	(²)	3	3	(²)
China, Mainland ³	(²)	8	0	0	0	0
Cuba	3	3	1	(²)	0	13
France	28	20	42	39	96	53
Germany, West	12	63	38	48	112	57
Hong Kong	(⁴)	0	0	2	14	10
Israel	(⁴)	0	0	11	0	0
Italy	1	9	7	26	71	37
Japan	164	330	557	598	698	584
Netherlands	13	31	15	8	14	4
Panama, Rep. ⁵	(⁴)	17	35	41	20	16
Philippines	(²)	2	3	4	28	12
	(⁴)	(²)	8	2	8	2
Rumania	(⁴)	0	0	7	0	0
Spain	5	13	55	82	1	2
Switzerland	2	16	5	10	9	3
Taiwan (Formosa)	(⁴)	(²)	12	16	9	29
United Kingdom	9	28	14	20	35	14
United States ⁵	721	970	804	529	701	481
USSR	(⁴)	2	0	9	24	0
Other countries	12	8	5	13	23	46
Total	982	1,573	1,610	1,482	1,897	1,372

¹ Figures for some countries are less than 5-year averages. ² Less than 500 bales. ³ Includes Taiwan (Formosa) prior to January 1, 1953. ⁴ If any, included in other countries. ⁵ Mostly for transshipment.

Source: *Anuario Estadístico del Comercio Exterio de los Estados Unidos Mexicanos*, *Revista de Estadística*; U. S. agricultural attachés and other representatives abroad.

TABLE 3.—TRANSSHIPMENTS OF COTTON FROM MEXICO THROUGH U.S. PORTS, BY COUNTRY OF DESTINATION, AVERAGES 1950-54 AND 1955-59, ANNUAL 1960-63 ¹

(Bales of 480 lb. net)

Destination	Year beginning August 1					
	Average		1960	1961	1962	Aug-May 1963
	1950-54 ²	1955-59				
	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales
Australia	(³)	23	17	13	27	15
Belgium & Luxem.	98	67	19	9	16	7
Canada	5	7	0	0	0	0
Chile	4	6	1	1	6	20
Cuba	7	5	2	0	0	0
Czechoslovakia	0	0	0	4	14	28
France	56	48	88	61	100	47
Germany, West	71	161	112	51	79	32
Hong Kong	3	10	7	6	1	(³)
Indonesia	2	7	(³)	0	0	0

See footnotes at end of table.

TABLE 3.—TRANSSHIPMENTS OF COTTON FROM MEXICO THROUGH U.S. PORTS, BY COUNTRY OF DESTINATION, AVERAGES 1950-54 AND 1955-59, ANNUAL 1960-63 ¹—Continued

(Bales of 480 lb. net)

Destination	Year beginning August 1					
	Average		1960	1961	1962	Aug.-May 1963
	1950-54 ²	1955-59				
	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales
Italy -----	33	56	60	44	115	70
Japan -----	319	214	111	50	2	9
Netherlands -----	56	75	21	5	19	4
Norway -----	5	7	5	3	4	2
Philippines -----	(³)	2	3	2	2	(³)
Portugal -----	2	1	19	13	22	(³)
Rumania -----	0	0	1	20	0	0
South Africa, Rep. -----	(³)	2	5	14	16	8
Spain -----	42	20	56	50	(³)	0
Sweden -----	22	24	4	2	3	2
Switzerland -----	23	21	24	16	41	14
Taiwan (Formosa) -----	(³)	2	12	8	1	1
United Kingdom -----	108	108	32	28	38	17
USSR -----	0	2	0	15	15	0
Other countries -----	22	17	18	12	35	32
Total -----	878	885	617	427	556	308

¹ Includes linters, waste, gin sweepings, and hull fibers but does not include transshipments to Canada by railroad and exports direct from Mexican ports to other destinations. ² Figures for some countries are less than 5-year averages. ³ Less than 500 bales.

Compiled from official records of U.S. Department of Commerce, Bureau of the Census.

TABLE 4.—TRANSSHIPMENTS OF MEXICAN COTTON THROUGH SPECIFIED U.S. PORTS, AVERAGES 1955-59, ANNUAL 1960-63 ¹

(Bales of 480 lb. net)

Port	Average				
					Aug.-May
	1955-59	1960	1961	1962	1963
	1,000 bales	1,000 bales	1,000 bales	1,000 bales	1,000 bales
Brownsville -----	587	522	388	449	289
San Diego -----	143	73	10	77	2
Houston -----	9	7	8	18	8
Galveston -----	4	6	4	4	1
Los Angeles -----	47	5	7	3	6
Corpus Christi --	7	2	2	3	2
Other ports -----	88	2	8	2	(²)
Total -----	885	617	427	556	308

¹ Seasons beginning August 1. Transshipments include linters, waste, gin sweepings, and hull fibers, but do not include transshipments to Canada by railroad. ² Less than 500 bales. Compiled from official records of the Bureau of the Census, U.S. Department of Commerce.

TABLE 5.—PRODUCTION OF MANMADE FIBERS IN MEXICO, ANNUAL 1950-63 ¹

Year	Rayon filament	Rayon staple	Non-cellulosic yarn and staple	Textile glass	Total Man-made
	1,000 bales ²	1,000 bales ²	1,000 bales ²	1,000 bales ²	1,000 bales ²
1950 -----	59.8	2.3	0	0	62.1
1951 -----	66.0	6.0	0.4	0	73.3
1952 -----	62.9	11.5	.4	0	74.8
1953 -----	58.1	10.4	.2	0	68.7
1954 -----	74.4	18.3	.6	0	93.3
1955 -----	87.6	26.2	.6	0	114.4
1956 -----	101.1	30.2	1.0	0	132.3
1957 -----	86.9	31.2	2.1	0	120.2
1958 -----	92.1	40.0	3.7	0	135.8
1959 -----	104.6	40.8	5.4	1.5	152.3
1960 -----	107.3	38.1	7.5	2.5	155.4
1961 -----	96.1	43.1	12.7	2.9	154.8
1962 -----	112.7	43.3	26.0	3.0	185.0
1963 -----	119.4	51.9	36.2	3.1	210.6

¹ Calendar years. ² Cotton bale equivalent of 480 lb. net. Source: Textile Organon.

TABLE 6.—COTTON: C.I.F. OFFERING PRICES PER POUND FOR SPECIFIED GROWTHS OF S.M. 1-1/16 INCHES, IN LIVERPOOL, AND BREMEN. GENERALLY FOR PROMPT SHIPMENT, ANNUAL 1957-61, MONTHLY 1962-63 ¹

Year and month	Liverpool		Bremen	
	United States	Mexico	United States	Mexico
	Cents	Cents	Cents	Cents
1957 -----	35.44	34.22	35.11	34.36
1958 -----	32.57	29.40	33.20	29.42
1959 -----	29.41	29.21	29.47	29.07
1960 -----	30.51	30.34	30.40	30.58
1961 -----	30.83	30.07	30.58	30.50
1962:				
August -----	30.04	29.09	29.98	29.01
September ---	29.88	28.42	29.48	28.62
October -----	29.82	28.41	29.30	28.47
November ---	29.71	28.78	29.66	29.16
December ---	30.16	29.62	30.05	29.75
January -----	30.72	29.85	30.35	30.04
February -----	31.30	29.70	30.45	30.10
March -----	31.51	29.31	30.50	30.26
April -----	30.34	29.06	30.52	30.18
May -----	28.98	28.98	30.45	30.21
June -----	28.96	28.92	30.40	30.31
July -----	28.91	28.91	30.22	30.51
1963:				
August -----	28.75	29.16	28.82	29.82
September ---	28.69	29.48	28.58	29.85
October -----	28.68	29.26	28.40	29.63
November ---	28.74	29.19	28.69	29.65
December ---	28.90	29.36	29.10	29.75
January -----	29.11	29.76	29.31	29.89
February -----	29.32	29.73	29.55	30.02
March -----	29.44	29.70	29.69	30.18
April -----	29.68	29.59	29.70	29.98
May -----	29.16	29.76	29.80	29.89
June -----	29.10	29.89	30.02	30.02
July -----	29.22	29.42	30.02	29.71

¹ Beginning August 1.

Source: Dudley Windel, Liverpool; Bremen Cotton Exchange.

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